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DIPHTHERIA.*

BY W. F. HERTZOG, OLEY, PA.

Mr. President and Fellow-Members of the Berks County Medical Society:

I do not intend to inflict upon you a lengthy essay on diphtheria; neither do I intend to worry you with a dissertation on that new so-called cure of diphtheria—antitoxine. I simply wish to make a few remarks on some points in diphtheria, basing those remarks on an epidemic from which we suffered in Friedensburg during the last few months, and then leave the floor to enable you of greater ability and riper experience to discuss the same. My aim is not to instruct, but to be instructed.

When the church bell of a village in which a medical man lives tolls four times in 24 hours, announcing that many victims of diphtheria out of one family, he can't help but become interested.

I have reason to believe that our epidemic was talked of all over Pennsylvania, if not beyond her boundaries; and, therefore, a report of it to this body seems to me eminently proper. Again, you men of Reading must be interested, because Friedensburg, for sanitary purposes, must be considered a suburb to your city, although nine miles away. There is daily communication between us by stage, by market wagon, by business people and by visitors. Who knows but that during our epidemic the market produce you ate was prepared by hands infected with the Klebs-Loeffler bacillus? Again, before concluding my report, I expect to prove that we got our diphtheria from Reading. And, if we got ours from you, you, in turn, could get it from us; hence, we must become mutually interested in this epidemic.

Friedensburg has no legal limits, but what is ordinarily considered Friedensburg is inhabited by 180 families, 620 persons. Of these 180 families, only 18 suffered from diphtheria. You will at once perceive that our epidemic was of a very limited character. The 18 afflicted families consisted of 123 persons, 56 of whom suffered from diphtheria in various grades of severity. Of these 56 cases, 17 died—a mortality of 30 per cent. From this we perceive that our epidemic was of a very malignant type. In some epidemics the larynx becomes much more frequently involved than in others—in some epidemics 50 per cent. of the deaths occur as a result of this involvement. In our epidemic only four cases occurred, all terminating fatally—a mortality from this accident of 23.5 per cent.

One of the most frequent complications of diphtheria is paralysis. This is so frequent as to be regarded by some authors as a symptom; but, as a rule, it occurs later as a sequala. It occurred in 12 of our 56 cases, viz.: In 21.8 per cent. of the cases. In some bad epidemics paralysis occurs in 40 per cent. of the cases. Ten of our cases were too quickly overwhelmed by the diphtheritic poison for paralysis to occur. Had these lived long enough it is altogether likely that all, or, at any rate, most of them, would have suffered from this accompaniment or consequence of this dreadful disease. In one of my cases paralysis of the soft palate followed fully three weeks after apparent recovery. These paralyses are caused by the ptomaine manufactured by the Klebs-Loeffler bacillus; but whether its action is

*Read before the Berks County Medical Society, Feby. 12, 1895.

central or peripheral, is a mooted question. It is one upon which I would like to have your opinion. I can understand how the minor paralyses that most frequently occur may be due to an impression upon the peripheral nerves, but I fail to understand how a complete hemiplegia, such as occurred in one of my cases, can be produced by anything short of a central lesion.

Another frequent symptom or complication of diphtheria is albuminuria. This is recorded only three times in our epidemic. I cannot vouch for the correctness of this, because examinations of the urine were not made as a rule. One of my cases died from this accident occurring, as a consequence to a bad attack of diphtheria. From my studies of this subject I believe this to be a valuable diagnostic point in doubtful cases. When you are not positive whether you have a case of pseudo-membranous croup or laryngeal diphtheria, examination of the urine may solve the problem. It certainly occurs in one-half to three-fourths of the cases. As a rule, it does not occasion uremia nor anasarca. It is more dangerous than that following scarlet fever.

Another symptom noted in two of our cases was suppuration of the lymphatic glands of the neck. This does not occur nearly so frequently in diphtheria as in scarlet fever.

There are three medical men in Friedensburg, and three different explanations of the origin of our epidemic of diphtheria. One medical man claims the epidemic had its origin in an epidemic of chicken diphtheria, which, he claims, prevailed in his part of the village in the summer and early fall. Before he made this claim I knew nothing of this epidemic among our chickens. On inquiry, I learned that a disease did prevail among the chickens of our village, not only during the summer of 1894, but already during the winter of 1893. This disease, I am told, caused an intense swelling of the eye-lids, completely closing the eyes. They became sore about the mouth, on opening which a foul odor was perceived. This disease, for all I know, may have been what is known as diphtheria in animals. Whether animal and human diphtheria are identical or not is a mooted question. For my part, I do not believe in their identity. It has not been proven as yet that diphtheria has been communicated to man by domestic animals, except, perhaps, by that midnight marauder, the cat. There is no shadow of a connection between our epidemic of diphtheria and the disease of our chickens. If it were due to the chicken disease, it would have made its appearance much eariler in the year. I mention this theory only to raise for discussion the point of the identity or non-identity of animal and human diphtheria.

Another medical man's theory is, that the epidemic was caused by the exhumation of bodies buried some 25 years ago in one of our cemeteries and their reburial in the other. These bodies were those of childrn who had died of diphtheria. I do not know the exact date of their exhumation, but it took place during the week beginning with October 22 and ending October 27, 1894—four full weeks before our first case and six weeks before the general outbreak of our epidemic. The exhumation was done by the father and brother-in-law of these children. The sister, together with her child, 2 years old, witnessed the exhumation. One of our Friedensburg boys, 8 years old, was there out of curiosity. All these people remained free of diphtheria. These people live four miles out of Friedensburg, and cannot have given it to us as third persons. There is no shadow of a connection between this exhumation and our epidemic; because, granting the possibility of such exhumation producing diphtheria, those opening the graves should have taken the disease first, or we should at least be able to trace them as carriers of infection from the graves to our sick ones. The Klebs-Loeffler bacillus kills a person, and is buried together with the body of his victim. He is now attacked, or, at any rate, his store of provisions, is attacked by the common earth-worm. In my opinion,

long before a quarter of a century has passed he is vanquished by the foe or has died of starvation. How long after burial the exhumation of bodies can cause diphtheria is a point for discussion.

My own explanation of the origin of our epidemic is that it was brought to us by a visitor. Friedensburg is built mainly along one street, running North and South. The Northern end of the village constitutes a school district, in which there was not a single case of diphtheria. The rest of the village constitutes the Academy school district. This school building has two rooms, an upper and a lower. In the upper room no case of diphtheria occurred. All our cases except two occurred in the lower room of this building, which I show you on the chart. Moreover, all the cases that occurred in this room, except two, occurred on one side. The cause of the epidemic was plainly to be sought in this school. The water-closet was intensely foul, but otherwise the hygienic surroundings were praiseworthy. Right here I might say that the "little house" in the country schoolyard is generally a very much-neglected house. This neglected water-closet, however, did not explain the epidemic—for the pupils of the upper room used it also. On further search I learned that a certain girl came to visit the family of John P. Schell, on the 15th of October, 1894. She was not feeling well when she came, and the next day the doctor who was called diagnosed "tonsilitis." Eighteen days later, November 2, 1894, Herbert Schell, the only child in the family, took sick, and the doctor said he was suffering from the same disease, viz.: "Tonsilitis." About the middle of November this boy went to school again, and sat at seats Nos. 2 and 14 on the chart. About 12 days later, November 26, 1894, I was called to the Haas and Schaeffer families, and found a case of diphtheria in each family.

From the 7th to the 11th of December diphtheria broke out in the Herbein, John Rhoads, DeTurk, Laucks, Bertolet, Youse, Seidel, Herzog, Lorah, Angstadt, Stuver, Geissler and Levan families. Thus, in 13 of the 18 families that suffered, diphtheria broke out almost simultaneously; hence, the source of infection was likely the same, and the infection must have taken place about the same time. After this original outbreak, diphtheria appeared in no other family except in the Aaron Rhoads and Yergen families. They got it by nursing at John Rhoads' and Seidel's respectively.

By looking at the chart you will notice that all the families that had diphtheria were those whose children sat near and about Herbert Schell. On further inquiry I learned that after his sickness Herbert Schell suffered from paralysis of the soft palate—proof positive that he had diphtheria, and not tonsillitis. As his was diphtheria, I feel justified in concluding that the visiting girl, whose case preceded his by 12 days, had likewise diphtheria, and not tonsillitis. This girl came to Reading from Iowa about four weeks before she came to Friedensburg, a sick girl. I could not trace her to a diphtheria-infected house, but certainly to a diphtheria-infected district. She lived at 220 Cherry street, and they "took her all around, because she was a stranger." About that time there was diphtheria to the North, South, East and West of that house.

To sum up the evidence of my explanation of the origin of our epidemic: A girl lived in a diphtheria-infected district for four weeks, then came to Friedensburg sick with a throat affection. Eighteen days thereafter a case of the same throat trouble occurred in the family whom she visited, this case being followed by paralysis of the soft palate. A few weeks after this boy returned to school diphtheria broke out in the families whose children sat near and about him, and in no others.

This is a line of evidence so complete as to settle the question beyond all dispute. Our epidemic, then, was plainly due to a mistaken diagnosis of the first two cases, thus allowing it to be carried to the Academy School.

The diagnosis of diphtheria, then,

CHART OF SCHOOL HOUSE WHERE FIRST CASES OF DIPHTHERIA WERE CONTRACTED.

WINDOW WINDOW WINDOW WINDOW WINDOW

PLATFORM.

1 Paul Rhoads, Willie Geissler.	8 Ella DeTuck, Luella Brumbach.	15	22
2 Herbert Schell, Curtis Schaeffer.	9 Alma Rhoads, Jennie Stuver.	16	23
3 Herbert Herbain, Harvey Schiedt.	10 Sallie Dengler, Maud Hertzog.	17	24
4	11 Grant Seidel, Asher Butterweck.	18	25
5	12 Willie Angstadt, Willie Haring.	19	26
6 Victor Larah, Louis Youse.	13 Herbert Schell, James Stuver.	20 Katie Herbein, Annie Levan.	27
7	14 Robbie Angstadt, Randall Hertzog.	21	28

DOOR

is a point for you to discuss. You may say the demonstration of the Klebs-Loeffler bacillus in the exudate will always settle the point. Very true; but we can't all be bacteriologists nor microscopists. Therefore, how to diagnose it without either microscope or culture fluid is the question the general practitioner is interested in. For my part, I see no reason for the careful or experienced physician to mistake even a mild case of diphtheria for a follicular tonsillitis. Should there be a doubt at first in the diagnosis, 12 hours' time will certainly clear up the matter.

I have learned in our epidemic that reinfection may take place in the same epidemic. In one of my cases, after all traces of membrane had disappeared, there was an aggravation of the general symptoms and the formation of a good-sized membrane on the left tonsil. In the much-afflicted Levan family, a case of "quinsy" had occurred December 8, which kept the girl, Annie, out of school for one week. She returned to school December 17, and on December 22—six days after she had returned to school, or two weeks after she became sick with "quinsy"—her sister Ada took sick and died in the morning of the 26th. During the night of December 25 Charles, Paul, Lot, Lizzie, Sallie, Katie and Minnie took sick. The parents took sick in the evening of December 26. Thus, these nine cases occurred within four days of Ada's sickness—a time too short to infect the whole family. I know full well that the time of incubation is short at times, where there is constant exposure; but, in this case, I know that the whole family was not in close attendance on the one sick child. Again, Daniel, one of the grown sons who died, came home December 26, and on January 8, 13 days thereafter, he took sick. If, in Daniel's case, the incubation stage was 13 days, then I have reason to believe that the incubation period in the other cases was about the same, which period of time corresponds exactly to the time between Annie's case of "quinsy" and the general outbreak of diphtheria in the family. In short, her attack of "quinsy" was a mild attack of diphtheria; if so, then she was afterward reinfected, for, according to the doctor's report, she had a very mild attack while the others were sick. To show the malignancy of the poison in this family, I may say that they all died in three and four days after they became sick, except Sallie, who lived two weeks, and then died of paralysis of the muscles of deglutition. The ages of those who died were 20, 18, 16, 10, 6, 4 and 1 1-2 years respectively. They were all very robust children.

Further, I have learned in our epidemic that late infection may take place. In one of my families four weeks after recovery, and three weeks after we had thoroughly cleaned and fumigated the house, a new case appeared. It is claimed that for three, and even four, weeks, virulent bacilli can be found in the throats of those who have had diphtheria. For that long a period patients must be isolated.

In the Schaeffer family the boy who had it and died was too young to attend school. His brother did attend, and sat beside Herbert Schell. Every evening when he came home he took off his coat and his little brother wore it until bed-time, thus proving plainly that a person may carry the infection and give it to others without himself getting it.

The success of our treatment seems to be more easily demonstrated by the mounds of earth in our cemeteries than by the enumeration of remedies. The one remedy I wish to condemn as useless is the peroxide of hydrogen. The drug which I consider the remedy par excellence is the bichloride of mercury, applied locally and frequently in spray form. The disease is a local disease; the general symptoms are due to a toxemia produced by the absorption of the ptomaine manufactured by the Klebs-Loeffler bacillus. To prevent this toxemia all you need do is to "shut down" the ptomaine manufactory which exists in the throat of your patient; not by inducing the laborers "to strike," but by killing them outright with the bichloride of

mercury. This ptomaine is very soluble and very readily absorbed by the lymphatics; it is the most virulent poison known, and is chemically identical with the poison of the snake-bite; hence, oftentimes its severity and rapidity of action. The principle of the antitoxine treatment is the fact that, during an attack of an infectious disease there are elaborated from the body-cells and fluids certain complex compounds which are antidotal to the toxine or poison producing the disease. When a sufficient quantity of this antidotal compound is produced the disease is arrested and convalescence is established. In diphtheria the Klebs-Loeffler bacillus produces the toxine; and in some mysterious way there is manufactured within the body an antitoxine which arrests or cures the disease. In order to procure this antitoxine an animal is immunized by attenuated diphtheria virus. When immunity is established sufficient of this antitoxine is held in solution by the serum of the blood to neutralize the diphtheritic toxine. The serum of the blood of such an immune animal is used in the treatment. This sounds Hahnemannian; but, whether Hahnemannian or regular, the results reported from the Kaiser and Kaiserin Friedrich Hospital in Berlin are very favorable. The mortality rate has been greatly reduced, if reports are true; but the German is apt to be too sanguine.

Before concluding my paper I wish to make a suggestion that may not be strictly medical, but is, at least, in the line of sanitation. This is the necessity of the incorporation of villages the size of Friedensburg. This may be inexpedient on political grounds, but is certainly absolutely necessary for sanitary purposes. There we are, huddled together almost as densely as you are in the city of Reading, and yet we are without power to protect ourselves from infectious and pestilential diseases. I often wonder that our epidemic did not spread over the village; and, whether the spread was prevented by the heroic efforts of the doctors or by a kind Providence, I know not. When, a few years ago, the intelligent and progressive people of Friedensburg asked for incorporation, the strong argument in favor of incorporation made by Dr. Herbst and myself was sanitation. We lost, and I have often wondered since our epidemic whether some of the grand jurors who refused us incorporation, as well as the lawyers and all others who opposed such a noble purpose, have not been conscience-struck since reading of our 17 deaths from a preventable disease.

THE GERMS OF MALARIA.*

BY DR. P. KAUBASSOF, KATTA-KOURGANE, RUSSIA.

In commencing my bacteriological studies on malaria during the summer of 1894, I prepared beforehand different culture media—the recognized media, and also some organic and inorganic ones, as glycerine, urine, grape sugar, iron, etc. At the same time I prepared dry preparations of the blood of fever patients; at first, only during the chill, the fever and the sweating stages, and three to four hours after the sweating, and the same length of time before the commencement of a new paroxysm of fever. Later on, similar preparations were made according to a particular plan, which embraced the period of from thirty-six to forty-eight hours, according to the type of fever. These preparations were made every two, three and four hours, giving an average of ninety-six preparations from each patient.

By a similar analysis of the blood I got so determinate an idea of the microbe that I knew beforehand what to look for in the cultures.

Before describing the germs I will devote a few words to the histological side of the question.

It is well known that dwellers in ancient Rome knew that they contracted the fever (malaria) where the atmosphere was pernicious, as in the marshes (or, as the district was named, "The Maremma), whence also comes the term, "malaria."

Balestra had demonstrated in specimens from marshes around

*Translated from the original French manuscript by Dr. E. W. Bing.

Rome, very small round cells, which were about one-one-thousandth m. m. in diameter, and the same corpuscles were found my him. present in the air of Rome.

Jarabowitz had also found in the malarial regions of the Caucasus a figure of eight shaped bacillus, which he considered the cause of malaria fever.

In 1879 Klebs Tommasi-Crudelli had studied the bacteriological characters of air, water and soil surrounding Rome, and found a bacillus which they separated by a pure culture, and which they named the B. Malariae, because it caused when injected under the skin of animals the typical paroxysms of intermittent fever. This bacillus measured from two to eight microns in length, was surrounded with tangled filiariae and contained spores.

Marchiatava found this bacillus in the blood of persons dead from pernicious fever.

Later on, however, Golgi and Arcangelli denied the discovery of these observers, and Vidol affirms that Klebs' bacillus alone has historical interest.

Lavern has described four forms of parasites which he has found in the blood of fever patients.

1. Spherical corpuscles most frequently met with; they are pellucid, about eight microns in diameter and contain no nucleus. These are found free in the blood, as well as on the red corpuscles. The smallest globules contain no pigment, while the larger have plenty of it distributed around them in a regular manner. The bodies have motion which lasts for three-quarters of an hour.

2. Flagella attached to the preceding corpuscles, attaining a length from 21 to 28 m. m.

3. Crescents, eight to nine microns in length and two in width, a mass of pigment is often found in their centre; their extremities are frequently joined by a slender thread.

4. Rosettes, spherical corpuscles, pigmented on the centre, and having segmented borders. These have ameboid motion.

This is all we know of the microbe of malaria. The results which I have obtained reduce all these contradictory theories to a common plane.

If we sow a drop of blood from a fever patient in milk or broth, or add the substances previously mentioned to boiled egg, after a few hours formations exactly resembling mycelium will be reproduced. These have for each variety of fever a particular form.

Very soon buds and globules appear on this mycelium and globules are found in the free state. They vary in size; the largest are about ten microns in diameter. Some resemble a placenta, with a slender cord. These globules, which I have called "Plasmodial globules," divide and give spheres or discs (plasmodial discs), having about the same characters of shape and size.

These may form directly from the buds of mycelium and may multiply. Sometimes they take the angular form. On the periphery of the discs thickenings occur, in the centre of which are observed luminous points which are the spores. The discs divide into concentric rings, which in turn have radial projections. In this way is formed a mass of small portions of protoplasm of diverse size and form, which we may call plasmodiae, and, if they contain spores, we may name them sporogenous plasmodiae.

Besides these we find formations of a rosette or daisy-like form, and also plasmodiae-bearing spores, which last are of different forms and sizes. These I have called "rosette bizarres."

Ordinarily sporogenous plasmodiae break up by degrees, and in the end we have a large mass of spores surrounded only by particles of plasmodial protoplasm in the shape of rings, tails or shoots.

It may be mentioned here that sooner or later pear-shaped formations, having many extensions, appear. We can see in these corpuscles a design which shows that their contents consist of future spores; thus, the pear-shaped corpuscles have sporangia, which are sometimes connected with the mycelium. The spores which have left the sporangia are all of the same size.

Sooner or later in the centre of the spores appears a corpuscle of a dark color, resembling a curved rod, and, later on, a globule. In the "rosettes bizarres" these bodies appear in the centre of clear spots and take on different shapes. When these bodies have lost the sac in which they were formed, and which was the envelope of the spore, they dispose themselves very queerly in crosses, arcs, rings, etc., and, what is more important, they begin to segment, and repeat it three, four or five times, and these segments again become subdivided, so that many globules of different sizes are produced, some almost invisible to high amplification. These should be regarded as a pro-mycelium.

The existence of these globules, dividing into segments of different size, is the most characteristic trait of the malaria fungus.

On the appearance of the pro-mycelium, clouding of the bouillon, which until now has remained clear, occurs; it is only after disturbing the liquid that one sees the cloud which rises from the bottom of the test glass and extends filaments through the liquid. Clouding of the bouillon usually begins after eleven or twelve days.

In cultures of two months' age pro-mycelium is found in the form of globules, which remain of the same size and undergo no further sub-division. But if sowed in fresh bouillon the segmentation goes on as before.

The completed formations do not respond equally well to stains; gentian, yellow, methyl, violet are the best stains. The spores do not take the color. The mycelium is well stained at first, but later on it becomes of a pearl color, and then cannot be stained at all. The pro-mycelium stains best of all, then the globules, discs and plasmodiae; these are also susceptible of double staining.

From the description it is evident that the germ of malaria should be considered as coccidia-mycetes. The continued and tertain varieties have about the same characteristic cycle of development. They also multiply and stain better than the preceding germs. We rarely see plasmodial globules with the coccidias.

Generally plasmodia carrying spores and assuming odd shapes are seen.

The pro-mycelium of tertian fever shows itself as globules in the form of a figure 8; it divides so quickly that the division is seldom seen. The globules often arrange themselves in a long twisted chain, which is characteristic of this variety.

The germ of continued fever is distinguished from the preceding by its pro-mycelium, which presents itself as corpuscles of diverse size and shape, beginning with bacilli and spindles and terminating with rhombs, squares or with subdivided globules. These often arrange themselves in chains, in which the rhombs and squares are joined together by their diagonals. The different forms occur in this chain, and bacilli, rhombs and semi-circles. All these forms are derived from the segmenting globule, which is met with most frequently in cultures, and which is the characteristic feature of all forms of the malarial fungus.

The only way to distinguish between the different varieties of germs is by making use of the pro-mycelium, and not the intermediate forms, which sometimes take on other shapes. For example, the germ of quotidian fever may occur as a curved rod or as a globule.

The only way to differentiate is by the use of staining fluids, by which the pro-mycelium becomes stained deeper, while the intermediate forms become paler or quite decolorized.

Some forms may enlarge gigantically, e. g., the rhombs of continued fever may extend across the whole field of the microscope, looking like a ribbon folded on itself several times. The pro-mycelium of the fungi possesses a particular and peculiar motion. It dances or turns on the same spot, or it hops from place to place, resting momentarily.

This is especially noticeable in continued fever, where small portions

of protoplasm of various forms and sizes (some black in color) undergo the motion.

At a temperature of 20 to 25 R. this motion may last for several days.

As to the pathogeny of the fungi, it is fatal to small animals, but in larger ones it first raises the temperature and subsequently depresses it. The poison can be either injected or given by the mouth. Infection occurs very quickly, sometimes in two or three hours, and the germs may be found in the blood. They go through the same cycle of development, but more quickly than in the cultures.

In man the manifestations are analogous. To find the germ in the blood it is requisite to make use not only of simple staining, but also of double staining.

For practical purposes it is requisite to know that the period of the chill is the time when the spores are liberated from their capsules. During this period the great mass of the protoplasm probably is burned up and provokes the fever. The period of sweating corresponds with the setting free of the spores, and the sub-normal temperature corresponds to the appearance of the mycelium.

There is foundation for the belief that quinine hinders the development of the fungus, and, especially the formation of spores in the plasmodiae, which then perish. This is why it is proper to give quinine for some time before the paroxysm. The muriate should be given ten to twelve hours, and the sulphate fifteen to sixteen hours before the chill.

The germs are found in all the excreta and in the vesicles of labial herpes. A zone of infection surrounds each patient and probably that is the cause of the repeated paroxysms.

How does the germ gain entrance to the organism? Probably by means of dust, or evaporating moisture from streams, ponds, etc. The domestic animals play a great part in the dissemination of the germs, especially birds, who are in malarial countries frequently attacked and in whose blood the germs live for three months or more.

ACETANILID VS. QUININE TO ABORT CHILLS AND FEVER; AND ACETANILID AS A DUSTING POWDER.*

BY BENJAMIN H. BRODNAX, M. D., OF BRODNAX, LA.

In 1890 I first used acetanilid in a case of catarrhal fever with convulsions, in an infant nine months old, with astonishing amelioration of all grave symptoms in fifteen minutes. My next trial of the drug was in intermittent fever in a family of three small children. The doses ranged from two to three grains, and when the time for the chills arrived the children were asleep and perspiring. I have employed the drug quite extensively, but it is espcially in chills and fever that I desire to emphasize its great merit. My mode of using it is as follows:

If there is time before the chill I give from one and a half to two grains of calomel in quarter-grain doses a half hour apart. Then, whether the bowels have acted or not, I give, according to the age, from two to six grains of acetanilid twenty minutes or half an hour before the expected chill. Gentle perspiration, with sweet and natural sleep, usually promptly follows the administration of the drug, from which the patient wakens entirely relieved and ready to go about in half an hour.

When there is not time before the chill to administer the calomel it may be deferred until afterward; but the acetanilid may be given immediately before or during any stage of the chill or fever, with the happy result of promptly inducing sleep and gentle perspiration. Should the desired effect of the drug, viz., sleep and perspiration, not follow its administration within a half hour, a second dose of equal amount should be given.

The after-treatment consists of an acid tonic, viz:

R.—Acidi. nitro. muriatici dil.floz.j
Ferri sulphatis . . gr. lxxx.—M

This should stand for twenty-four

*Read Feb. 13, 1895, by Dr. Oscar H. Allis, before the County Medical Society.

hours. S.—Ten drops in water three or four times a day.

On Friday, October 19, I was called to see a young man who had had "dumb" chills, with vomiting and severe gastric disturbances, for six days, the attack coming on daily at 1 o'clock and lasting until midnight. When I arrived, at 7 o'clock in the evening, he was vomiting thick, glairy mucus, and was unable to retain anything on his stomach. I immediately administered hypodermatically one-quarter of a grain of morphine and gave six grains of acetanilid dry upon the tongue. He had one slight attack of vomiting soon after, but a little later fell into a sweet and a refreshing sleep, from which he did not waken until 7 o'clock the next morning. As the next chill was expected at 1 o'clock he was ordered to take six grains of acetanilid twenty minutes before. No chill followed, and none have taken place since. The after-treatment with the "acid tonic" was pursued, as is always my custom.

I have now treated several hundred cases of chills with acetanilid, and without quinine, and report my success in the hope that others will be induced to give it a trial.

Acctanilid and boric acid, in equal parts, as a dusting powder, I have used extensively in ulcers, burns, etc. I find the powder especially serviceable in the excoriation of infants and fleshy people; with it I dust the funis of the new-born babe, while over the vulva of the mother I place a little cotton previously well dusted with the powder. Made into a paste with glycerine, I have used it in a vaginal tampon to allay uterine pain.

In the case of a female, 61 years of age, almost crazed with the itching from a pustular eruption that covered the lower part of the abdomen, vulva and anus, the powder well dusted over the affected parts, after first moistening the parts with dilute carbolic acid, was followed by six hours of consecutive sleep. She was wakened by a return of the itching, and, rising, washed the parts and reapplied the dilute carbolic acid and powder, with immediate return to sleep. A great improvement was observed the next day, and in a few days the parts were well. Previous to the application of the powder she had not slept well for several nights even with the aid of morphine.

Internally I have used it to correct foul breath; also in dysentery and diarrhea. When taken on the tongue and held in the mouth a few moments before swallowing, it has the effect of allaying the distressing thirst that accompanies fever.

AMNESIA.

BY J. G. HENDRICK, M. D., CENTRE POINT, TEX.

Amnesia, in its varied forms, affords interesting study to the thoughtful physician and opens a field for investigation by the physiologist and pathologist.

Evidence supports the theory that memory is located in right hemisphere of the brain. Another peculiar fact is that memory has different phenomena of expression; one may be lost while others are retained intact in cases of lesions or injury by disease and wounds.

Some years since a peculiar case came under my observation. A gentleman consulted me for treatment of a peculiar form of amnesia, the result of severe cerebral inflammation, from which he had recently recovered.

It was impossible to get a history of his case, as he lived some distance, and had been treated by his family physician. From what information I could get, and the symptoms present at the time, I was satisfied that the seat of the inflammation was in the right parietal region. The pupil of the left eye was largely dilated, sensitive to light, requiring a shade to be worn. Speech was distinct, but a little slow, and somewhat hesitating, but he answered questions correctly.

The most peculiar feature of his case was that, being a man of average intellect and education, since his recovery it was impossible for him to write a word or letter until it was spoken to him. He knew and could call by name all his acquaintances, knew his own name, but when

given a pen or pencil and requested to write any name or other word, it was impossible for him to do so unaided. However, if he was requested to write, and then each letter called off slowly he could readily accomplish the task.

The same difficulty was apparent if he was required to write a combination of figures, each figure having to be called off to him separately.

The faculty of reading writing or print remained intact with him. After some length of time the lost faculty was fully regained and average health restored.

Dr. Roberts Bartholow, in the Cincinnati Medical Journal, in 1870, reported the case of D. B. Lawler, which was the opposite of my case. Mr. L. was an intelligent business man, possessed of a superior mind by nature, but from disease he lost the power of reading written or printed matter, but could write and sign his name correctly; however, such writing and printing was only so many meaningless marks to him after his task had been accomplished. He knew what he wished to write perfectly well, but had lost the power of reading. All other faculties were intact.

At the autopsy Dr. Bartholow found the principal arteries of the brain, as well as some in other portions of the body, calcified and enlarged, together with some lesions of the brain on the left side.

Singular was the case of Lieutenant Brady, referred to in "The Times and Register" of December 15, 1894, who lost a portion of the right side of the brain by a gunshot wound and suffered a remarkable loss of memory, and, after recovery, he knew and could call by name all his associates since the recovery took place, but could not remember any one he knew before the injury.

Each one of these cases lost the power of memory, but in a different manner in each case. What was lost by one was retained by another; therefore, it is plausible to presume that memory is controlled by distinct parts of the brain and that disease may destroy one part, leaving the others to exercise their functions.

POINTS CONCERNING THE VOICE.

BY LOUIS LEWIS, M. D., PHILADELPHIA.

Next to beauty of face and form no physical attribute of the human race is more pleasing than a melodious voice. The power of song has fascinated the world ever since the days of the Bible; since David and Jehoshophat employed bands and choirs of singers to sound the praise of God; and since, among the people returned out of captivity into Babylon, hundreds of professional singers, male and female, were paid, and entertained and honored in their own cities. Even to this day the Jews are noted for their excellence in singing. But there is also a sort of magnetism about a sweet-toned speaking voice that has an irresistable influence, and easily counterbalances any imperfections of personal appearance; whereas harsh discordant tones detract from a favorable impression of the speaker, and grate forebodingly on the ear. An unpleasant voice is often congenital, and we cannot all be silver-tongued orators; indeed, we often hear those who painfully convince us that "silence is golden." Yet training and medication can render infinite service to both singers and speakers, in devloping a voice that is naturally good, or in improving one that is functorially deficient.

The average compass of a singing voice is two octaves, or 16 notes; above or below this the sound becomes harsh and strained. Female notes are usually an octave higher than corresponding notes in the male, and their vocal cords resemble those of boys, producing "altos" and "sopranos." As the boy merges into manhood the cords increase in length by about two-thirds, and his voice then becomes "bass" or "tenor;" but in the interval it gives or breaks in a characteristic discordant manner. In old age it weakens and falters, through calcification of the cartilages and loss of command over the muscles; and when, at any time, a

singer begins to experience serious loss of control over his voice, especially when he loses his "falsetto" notes, paralysis of the tongue may possibly be impending.

The singing voice in birds is produced in lower segments of the larynx than in man, by means of several special muscles, which regulate the distance between the vocal cords. The best birds possess five pairs of these muscles; parrots, which only "talk," have three pairs; while fowls, gulls and such, which cannot modulate their tones, have but one pair. In storks, cranes and swans the trachea reaches down below the neck, the lowest ring or convolution being placed behind the sternum. Perhaps this enables them to emit the sustained increasing wails that Tennyson has described in "The Dying Swan:"

"The wild swan's death-hymn took the soul
Of that waste place with joy
Hidden in sorrow; at first to the ear
The warble was low, and full and dear;
And floating about the under-sky,
Prevailing in weakness, the coronach stole
Sometimes afar, and sometimes anear;
But anon her awful jubilant voice,
With a music strange and manifold,
Flowed forth on a carol free and bold."

Even fishes are musically inclined, for there are at least four varieties that have voices—the trigla, the cottus, the cordonia and the pogonia. The trigla grunts like a young pig, when removed from the water; hence its nick-name of "Peter Grunter." The cottus gives out a squeak when its body is squeezed, like the familiar toy of our childhood. The cordonia emits a strange sound by means of an air-bladder, as also the pogonia, which is better known as the "tambour" or drumfish." Frogs, toads and crocodiles obtain their croaking sounds from the upper larynx, just like man and mammalia; while some lowly creatures, as crickets, katydids and other grasshoppers, which are devoid of vocal apparatus, supply a not unmusical sound by friction of their legs and wings. Even some snakes produce a mechanical sound when they are "rattled."

Ravis, or hoarseness, and aphonia, or loss of voice, are constant sources of dread to singers, actors and elocutionists, as overwork and changes of temperature render them constantly liable to these disqualifications. The causes are very various, ranging from simple capillary congestion in the vocal cords, which thickens their edges and hinders their vibrations, to far graver conditions, such as folliculous or syphilitic pharyngitis, ulceration from catarrhal, tuberculous, rheumatic or syphilitic laryngitis; pachyderma laryngis; paralysis of the laryngeal muscles, sarcomatous, cancerous or other growths in the larynx oesophagus, aneurism of the transverse aorta, and lesions of the medulla oblongata. Sometimes a web-like structure unites the cords, notably in syphilitic laryngitis, causing aphonia. Sir Morell Mackenzie operated on a lady who was voiceless, owing to a papillomatous web that passed between the cords and bound them together; on its removal her voice was permanently established. Aphonia may also be initiated by immoderate doses of ammonia, and nitric and sulphuric acids; and hoarseness, in a lesser degree, by stramonium, atropia, and belladonna.

Hoarseness arising from simple causes may be relieved by leeches, mustard or other counter-irritation; a pellet of borax or gum arabic, dissolved in the mouth; infusions of sage, horseradish, pellitory or pomegranate, used as gargles; inhalations of chloride of ammonia or sulphurous acid vapor; nitrate of silver solution (gr. x to the ounce), locally; or, alum (gr. x to the ounce), cocaine (2 per cent.), boroglyceride (1 in 20), or ipecacuanha wine, in the form of spray. Internally, 10 grain doses of cubebs, or 5 minims of dilute nitric acid; or a drachm of equal parts of ammoniated tincture of guaiacum and syrup of senega; any of these may be taken three or four times a day.

Aphonia may be functional or organic, temporary or permanent. The functional variety is often hysterical,

due to paresis of the abductor muscles, and may be associated with uterine or ovarian disorder; or it may follow sudden mental shock. Mineral tonics, strychnia, cocoa and valerian are indicated, with galvanism and astringent sprays. In organic aphonia, swabbing with strong nitrate of silver solution is useful, and astringent sprays and tonics. But many cases call for surgical interference, as the removal of neoplasms, etc., by the knife, ecraseur, caustics, forceps or galvano-cautery.

I have had no experience in the use of "animal extracts," or I might be prepared to recommend "laryngine" to make a man sing.

Book Reviews.

A MANUAL OF BANDAGING, ADAPTED FOR SELF-INSTRUCTION. By C. Henri Leonard, A. M., M. D. Sixth edition, with 139 engravings. Cloth, octave, 189 pages. Price, $1.50. The Illustrated Medical Journal Co., Publishers, Detroit, Mich.

The main feature for commendation of this book over other similar works is that each illustration shows the direction of the various turns of the bandage with arrowheads, and each turn is properly numbered; this renders the book a self-instructor to the reader of it, who has but to put the various bandages about the limbs of an office companion a few times, when the "trick" of its application upon a patient has been learned. It takes the place, in this way, of hospital drill. Besides the "Roller Bandages," the various Ts, "Cravats," "Slings," "Tailed," "Adhesive" and "Plaster" bandages, and "Immovable Dressings" are given. The book is divided into sections treating of "The Bandages of the Head," of "The Body," of "The Upper Extremity," of "The Lower Extremity," "Knots," "Strappings," "Compresses" and "Poultices," with full description of making and applying the same. There is an illustration for nearly every bandage described. It has been recommended as a text book in various medical colleges and hospitals in this country, and has had two editions sold abroad. A medical student could profitably spend his vacation evenings in mastering the application of bandages by using this book as a guide; and to a practitioner it would not come amiss.

BOOKS AND PAMPHLETS RECEIVED.

CYLINDROMA ENDOTHELIOIDES OF THE DURA MATER CAUSING LOCALIZING SYMPTOMS AND EARLY MUSCULAR ATROPHY. By L. Bremer, M. D., and N. B. Carson, M. D., of St. Louis, Mo. Reprinted from the American Journal of the Medical Sciences, February, 1895.

THIRTY-FOURTH ANNUAL REPORT OF THE BOARD OF MANAGERS OF THE WOMAN'S HOSPITAL OF PHILADELPHIA. January, 1895.

A CLOTHING-CASE FOR THE ARMY AND NAVY AND A DEVICE FOR TRANSPORTING THE WOUNDED. Read before the International Medical Congress at Rome. By W. Thornton Parker, M. D., Groveland, Mass. Reprinted from the International Medical Magazine for November, 1894.

OFFICIAL LIST OF MEDICAL OFFICERS, ACTING ASSISTANT SURGEONS AND HOSPITAL STEWARDS OF THE U. S. MARINE HOSPITAL SERVICE; ALSO LIST OF U. S. MARINE HOSPITALS AND QUARANTINE STATIONS. January, 1895. Washington: Government Printing Office, 1895.

A lady whose husband was ill with a severe cold was recommended to make for him a cup of flaxseed tea at bedtime. By mistake she employed bird seed instead, and it was with difficulty she could restrain her afflicted spouse from singing all night.

The Times and Register.

A Weekly Journal of Medicine and Surgery.

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TUBERCULOSIS.

Since the publication of the paper on "A Practical Theory and Treatment of Pulmonary Tuberculosis" in the first numbers of the present volume of the "Times and Register," by the editor, much has been said and written strengthening the views taken therein.

Recently Professor Liebrich, of Germany, read a paper upon the treatment of lupus by cantharidinates, in which he brings out the following theory on tuberculosis. "The resisting power of the organism is very great, and when a healthy being is inoculated with tubercle bacilli, no general tuberculosis results, but at most only the production of localized nodules. General disease could only supervene where there was a predisposition. The healthy human cell resists the action of parasites, and the disease-causing parasite can only attack it when it is weakened."

This view is in exact accord with that advanced in our series of articles on consumption. The tubercle bacillus attacks only dead or dying cells. If there is no stasis of waste elements in the tissues (lymphatic stasis), the bacillus will depart with other waste elements of the body, through the various emunctory organs. If there is such stasis, a favorable opportunity opens for the growth and propagation of the bacillus, but the latter only stands as a phenomenon of the disease and in no way causative. It is very likely of reactionary nature, under certain conditions, but in no way causative of the stasis.

As a treatment for weakened vitality of cells Professor Liebrich has called attention to the uniformity with which lupus disappears under a long course of treatment on cantharidinate of sodium and potassium, covering years, if necessary. The drug is given in dose of one or two decimilligrames (one-fiftieth of a grain), which may be taken without inconvenience. It is well worth trying

As to the point of the communicability of tuberculosis, it seems to us that Boards of Health carry the question too far. The question hangs on the proving that lymphatic stasis, or devitalized blood cells are contagious, a thing which is as preposterous as it is absurd.

THE TREATMENT OF COLDS.

Now that the time of year has arrived in which extra precautions must be taken against contracting acute catarrhal inflammations of the respiratory tract, it may be well to inquire into some of the causes which lead to the production of these diseases and the most efficient methods of treatment.

As the warm days approach, alternating as they frequently do with a brief cold spell, the habit of laying off winter clothing becomes seemingly imperative. The dust and germinating animalulae which float about in the air are active local irritants to the mucous membranes of the respiratory tract, and the two agents go hand in hand for the production of colds.

The cold winds of a northeasterly storm, bringing with them more or less chemical changes in the atmos-

phere, are also active causative factors. Many of us lay off our coats in the heat of bodily exercise, while raking up gardens, lawns or yards, and in this manner our susceptibility to the contraction of colds is augmented.

The relationship between a cold and influenza is not marked. We have been so accustomed to call every little cold "an attack of the grip" that we run great danger, therapeutically, of hitting wide of the mark. Grip is a distinct, emphatic disease, which, when one has it, he is not very apt to mistake for an ordinary cold; while, if one thinks he has the grip, but is not quite certain of it, the malady is pretty sure to be the ordinary cold.

In the treatment of colds the danger lies not so much with the inflammatory condition itself, as to the liability which arises from continued irritation or direct extension of the inflammatory conditions to lung structures. Many an incipient phthisis arises from a simple cold.

Once thoroughly inaugurated, these spring colds usually occupy about a week of time, with the aid of the various remedies employed. The dangers are that we overcrowd remedies without regard to the pathological conditions presented. We must bear in mind that the system must become accustomed to a new condition of affairs, and that great prudence is necessary in exposing oneself to outdoor temperature without sufficient protection.

It is possible in the early stage of a cold, especially when such is of the nasal variety, by thoroughly irrigating the nose twice a day, with warm water, in which a little borax has been placed, to abort an attack.

To do this no syringe is necessary, but by simply immersing the nose in a basin of water, and with forcible inspiratory and expiratory movements, holding the breath at the epiglottis, the nasal passages may be thoroughly irrigated. Of course, there are advantages in the syringe, which may be preferable from a point of neatness.

Aconite holds an excellent place in aborting colds, but care must be taken in its employment, that fresh colds are not contracted. The dose usually employed should be a drop an hour, or half hour, as the severity of the case requires, which should be maintained until free perspiration results.

Quinine may also be employed as well as the coal-tar derivatives, but are not as efficient as a well-directed course of treatment by aconite.

NEW OPERATIONS FOR THE RADICAL CURE OF INGUINAL HERNIA.

In spite of the already large number of methods which have been devised for the radical cure of hernia the list still grows apace. This is conclusive evidence that we have as yet no method that is uniformly successful. All conservative writers agree that after every one so far devised there will be a large number of recurrences. The reason for so large a proportion of failures is not difficult of explanation. The success of the operation depends, of course, upon securely obliterating the canal through which the hernia descended. Operators have displayed great ingenuity in devising means to secure this obliteration, the success of which depends upon the various structures retaining the positions in which they are placed at the time of operation. Unfortunately this expectation is not realized. The stitches give way, or the transplanted flap undergoes atrophy in the new position, and but little resistance is left to the redescent of the hernia. It will be remembered, of course, that most of these operations are performed in cases in which the tissues are altered by the long-standing rupture. The truss still remains, therefore, the best method of dealing with a reducible hernia, if it can be retained thereby.

BARRED OUT OF THE MASSACHUSETTS MEDICAL SOCIETY.

The Massachusetts Medical Society has voted to debar from its membership all graduates from the College of Physicians and Surgeons, of Boston.

Surgery.

IN CHARGE OF
DR. T. H. MANLEY, New York.

HOW THE ANTISEPTIC ACTION OF IODOFORM IS EXPLAINED.

By Dr. Stchegoleff, of St. Petersburg.

The above author has under the above title presented the most comprehensive and scientific contribution on the therapy of iodoform that has yet been written; and goes a great way in the direction of classifying many mooted points on this important subject, yet, withal, it leaves much, still by no means settled.

A few of the leading features of his valuable brochure, only, can be noted here, but these are of such vital importance as not to be considered lightly by those of us interested in the antiseptic theory, and the rationale of treatment which recognizes that for its foundation stone.

Iodoform, he tells us, was discovered by Surrellus in 1822, and was introduced into surgery by Mosetig Moorhof in 1880, who noted its specially favorable action on the tubercular lesions of bones. Since then it came into vogue, in general surgery, with surprising rapidity.

It was soon discovered, however, by Schede Konig, Kocher and others that its employment might produce grave intoxication or even cause the loss of life. Nevertheless, nearly all surgeons use it in preference to every other antiseptic, in dressing sores or wounds. It seems to diminish the secretion of wounds, and, when left on long, does not cause any cauterization of the tissue. Baumgartner, Marchand and Bruns observed that it modified markedly the histological processes in granulating lesions. Finally, many surgeons soon came to regard iodoform as practically a specific for tubercular lesions.

Nearly all authorities argue that it is not an antiseptic, when tried by the experimental test; and, admit that it exercises no influence on the majority of pyogenic organisms on which its role is said to be considerable in antiseptic surgery.

It was, therefore, with a view of endeavoring to clear up the discordant notions on the action of the drug in clinical and experimental observations, the author undertakes a series of experiments in the laboratory which he himself declares are not quite definite.

Heyn and Thorskild were the first observers who called into question the claims of iodoform as an antiseptic in 1887. These Danish surgeons, to their great astonishment, observed in a laboratory test that iodoform in no manner whatever influenced the vitality or growth of pyogenic germs. Bacteria developed and grew in vast colonies in iodoform with bouillon. They did equally well in gelatine and iodoform oil. Maylard likewise also demonstrated that iodoform was entirely inert in action on the most virulent micro-organisms, especially the bacteria of anthrax, of septicemia and cholera bacilli. Kunz, Senger and Kuoncher, in laboratory research, had similar results. Indeed, Kunz went so far as to deny that iodoform in any manner influenced bacterial life. Tilanus proved that the chemical had no influence on the micrococcus putridus, and Maylard also proved that it left the bacterium-termo unaffected.

Experiments on animals gave the same results as cultures in artificial media. Lubbert, Meisser, Kunz and Schirner observed the same phenomena when they injected pure pyogenic cultures; or those mixed with iodoform. De Ruyter, a strong advocate of iodoform, while he admitting no influence of the drug on cultures in vitro, believed it had positive value in surgical use, as in suppurating wounds, etc.

He thought that under the influence of animal heat and biological activity the microbe iodoform was decomposed and liberated, thus inhibiting germ action.

De Ruyter believed that the infection and septicity of a wound depended on the toxics secreted by germs, and that iodoform produces its beneficial action by, in some manner, neutralizing these.

Mickulicz, Bruns, Verneuil and Billroth believed that iodoform ex-

erted a specific action on tubercule; how far this belief was supported by scientific test was to be proven. Bruns injected iodoform oil into tubercular joints—10 parts to 100. But Trogue and Tangel, in their experiment on tuberculous animals, found that iodoform made no impression on this specific microbe.

Roosing, among the first to examine into this question by test experiments, on the lower animals, took tubercular lung tissue of the rabbit, triturated it in a mortar with iodoform and then injected it into the cornea. Local tuberculosis developed as soon as in those in which the iodoform was left out, and, he noted, that in all these cases tubercle tended to generalize. Catrin repeated these experiments and concluded that iodoform in no manner influenced osseous tuberculosis; on the contrary, the irritation which the drug produced rather provoked its rapid spread. Filleau and Petil after a most extended and critical investigation into the question of iodoform-therapy on the bacillus of Koch, decided that it was quite impotent.

The author now gives his own personal observations, after a series of experiments on the animal, his purpose being to determine the value of the drug, if it had any, as a germicide, and to ascertain how it acted.

He commenced by testing it on the tubercular bacilli.

By a most ingenious contrivance with a medium of glycerine bouillon and iodoform, the latter always sterilized, he began. Without detailing the rather complicated technique and precautions observed, it is enough to say that he found, when the tubercle bacillus was exposed to the action of this warm fluid for 24 hours it was killed. He partly ascribed its prompt action to the solvent effect of the glycerine on the iodoform. 0.50 c. c. of the same mixture was now injected subcutaneously into the tissue of a guinea-pig. Sixty-five days later it was killed, when abundant masses of tubercle were found in the omentum. The thoracic organs were all healthy, however.

He then injected a virulent culture of tubercle with iodoform—10 to 100—into one animal and the pure culture into the other. Both died of tuberculosis, the one on which the iodoform had been used much later than the other.

In others he found that the iodoform mixture of the virulent culture, though not conferring immunity, always prolonged life. He therefore believes that, while iodoform is powerless to destroy tuberculous germs, it greatly modifies their action and limits their destructive power. On autopsy, he never saw as extensive ravages of the organs after injecting iodoform emulsions of the tubercle as when the pure culture was used.

Practically the same proportion of iodoform was used in the cultures of the various pyogenic bacteria. The staphylococci grew abundantly in the middle of the culture media, without any diminution of their energy or change in their biological or morphological character.

Now, the efficiency of the mixed injection of the staphylococcus culture and iodoform was tested on the living organism. These experiments gave more satisfactory results. In those animals into which hypodermic injections of the pure virus were made death followed within 36 hours, while those in which the iodoformized culture of the staphylococci was employed all survived.

To-day it is quite generally conceded, our author believes, that suppuration of microbic origin is produced by the chemical action of the toxine products of bacteria on the tissues. The researches of Grawitz, Barry, Scheurlen, Leber, Chrishuas and Steinmus he cites as definitely proving that the immediate cause of suppuration is bacterial; due to toxic products fabricated by the micro-organisms. This is demonstrated by the manner in which the intensity of germ action is modified by iodoform on the ptomaines; while the germ itself is quite untouched.

His experiments, he believes, have confirmed his hypothesis on the neutralizing action of iodoform on the toxines of micro-organisms of the pyogenic class.

His conclusions are as follows, viz:

First—Iodoform must be considered as an antiseptic.

Second—It exerts a positive influence on the tubercle bacillus.

Third—Iodoform introduced directly into the living organism with the tubercle bacillus, living and virulent, diminishes their action without opposing their development.

Fourth—Iodoform is not an antiseptic in the proper sense of the word, i. e.: It will not kill pyogenic micrococci, though it exerts an indirect action in suppuration. Put into direct contact with pus, it will not kill the germs, though it acts on the toxines; succeeding this action of iodoform, the germs lose their pyogenic properties and become inoffensive to the economy. This explanation is in harmony with chemical facts.

Clinical facts, it is true, are not in accord with laboratory experimentation. Heyer and Roosing, for instance, packed the vulva of a fat woman with iodoform gauze, and when they removed the gauze they found its meshes filled with microorganisms. However this may be, the fact remains that the surgeon knows from experience that he cannot yet replace iodoform with anything better; and until he does it must maintain its supremacy as a deodorizer and antiseptic of the first order.—Archives de Medicine. Experimentali et D'Anatomie Pathologique. 1st Nov., 1894.

FIN DE SIECLE TREATMENT OF GONORRHEA.

Among the numerous suggestions on the treatment of gonorrhea, with which the medical press abounds, none has appeared which is so entirely unique as that presented by Dr. Burnside Foster in a recent issue of the Journal of Cutaneous and Genito-Urinary Diseases. The method proposed is described as follows by the author: "As soon as may be, after we have established the diagnosis of a first gonorrhea, the patient should be etherized and properly prepared, a button-hole opening made in the perineum and drainage of the bladder established. Through a properly contrived apparatus the anterior urethra could then be thoroughly flushed with any antiseptic or cleaning fluid and treated on surgical principles. The details of the local treatment would vary with the fancy of the operator. The feasibility of packing and distending the anterior urethra with iodoform gauze suggests itself to me; but any one of a great number of methods would doubtless be efficacious."

Electro-Therapeutics

IN CHARGE OF
DR. S. H. MONELL, New York.

A SHORT STUDY OF GALVANISM.

The four articles which have preceded this have been devoted to an illustration of "how not to do it," in electro-therapeutic work.

Some physicians, in reading them, may recall their own early essays in this intersting field, and knowing better now, may extend their sympathy to Dr. Holmes and his combination battery. I now propose to devote a short chapter or two to a study of such elementary facts regarding both galvanic and Faradic currents as may assist the beginner to understand the principles governing their application in medical practice.

There are three factors in medical electricity:

1. Electro-motive force, which depends upon the difference of potential at the two poles.

2. Resistance, which is the obstruction of the conductor to the flow of the current through it.

3. Current.

These three factors are measured, and bear a relation to each other which is known as ohms law; to wit, the current is equal to the force divided by the resistance.

The E. M. F. is measured in volts, the resistance in ohms and the current, for medical uses, in milliamperes.

The galvanic current is primarily continuous, but may be modified and interrupted. It possesses three great properties, to which arbitrary names are given; viz., cataphoresis, electro-

it is the coagulating or drying pole. lysis and catalysis. These names merely represent various sides of a complex influence of the current upon matter through which it passes, and not separate and independent properties. Applied to the actions of the constant current, passing in appropriate dosage through the tissues (solid or fluid) of the human body, these terms are useful if not exact.

The cataphoric action promotes osmosis. Electrolysis is the breaking up of chemical compounds into their separate constituents. Catalysis is a complicated phenomenon and really includes cataphoresis and electrolysis. It cannot be fully defined, but it is applied to that property of the current action which dilates the blood vessels and lymphatics, increases the powers of absorption of the tissues, promotes asmosia and, therefore, increases bulk, especially in muscles. To these effects are to be added the influence upon molecular exchange and nutrition due to exciting or soothing the nerves themselves, or the parts which they supply; also the changes in the molecular arrangement of vital structures and in their nutritive activity produced by the electrolytic action which takes place at he same time, and, finally, the consequences of the mechanical transference of fluids from the positive to the negative pole.

This so-called catalytic action upon the nutrition and circulation takes place between the poles; is in fact the interpolar action. More marked effects occur directly at the poles, especially when the active electrode is metallic.

One of these effects, and the most remarkable of any, is that known as electrolysis. This action differs so greatly at each pole as to necessitate separate consideration.

Operating within the human body, which is an electrolyte of an extremely complex character, the positive pole liberates oxygen and chlorine and collects acids (sulphuric, nitric, hydrochloric, phosphoric), and hence blanches, hardens and dries tissues. Thus in hemorrhagic states In general the positive pole is anodyne, sedative, anti-congestive, denutritive and hemostatic. It relieves congestion and pains depending on it. With a mild current its local action is styptic; with a stronger current it is a chemical hemostatic; with a still higher intensity it is caustic, and in excess of the limits of medical dosage it will boil water and cook meats. With milk currents the positive pole lessens the capillary circulation. Upon the nervous system it decreases the excitability and soothes a painful nerve. It contracts non-striated muscular fibre. It attacks metals, and is the pole employed in the various forms of cataphoric medication.

The negative pole, on the contrary, liberates hydrogen and collects the alkalies of the body fluids (sodium, potash, lime, ammonia), hence has a liquefying or hemorrhagic action. This is in part due to the electrical osmosis set up from the positive to the negative poles, pushing the liquid elements of the tissues along the track of the current flow. The negative pole, therefore, increases the capillary circulation, increases the irritability of a nerve, softens and dissolves tumors, exudates, contractured muscles, etc., and promotes absorption. The polar action of the negative galvanic current is stimulating, congestive, derivative and alterative, promoting absorption by liquefying the tissues. With a stronger current and bare metal electrode the effect becomes caustic. Metals are not attacked. The negative pole dilates non-striated muscular structures; strictures of all kinds promotes and increases the menstrual flow.

When an excessive current density causes a galvanic burn the eschar that results from the positive pole resembles that of an acid caustic, while the eschar from the negative electrode resembles that of an alkaline caustic. In dermatological work and on a very small scale these effects are produced at will, and the pole selected according to the nature of the eschar desired. In most cutaneous applications, and where covered electrodes are used, a burn

is a rare occurrence, and only a result of carelessness or accident.

Any practical physician who familiarizes himself with the determined effects of each pole, and applies the same rules which govern him in the selection of different drugs, will have little trouble in selecting the proper pole to carry out any plan of galvanic treatment. Few books that suggest electricity in any disease specify what pole to use.

There is good reason for this omission, and both the polarity and proper dosage can easily be accurately applied to meet the indications as they occur. The careful physican who seeks to become a fairly skillful electro-therapeutist must be instructed by experience in regard to dosage and technique. From text books may be obtained much information of general value, but nothing short of clinical experience will make a man a good prescriber of either drugs or electricity.

In most therapeutic applications the chief interest centres upon a single electrode and polarity. This is called the active pole, while the opposite pole is used simply to complete the circuit and dispense the concentrated current. The active electrode should be placed as nearly as possible in direct contact with the diseased structures to be treated by it, and the dispensing electrode placed so as to include the diseased tissues between the two. Refinements of application and dosage relate chiefly to the treatment of special tissues, mucous tracts, tumors, gynecological work, etc., where one of the electrodes is bare metal. Common applications of galvanic currents upon external surfaces do not require any particular difference in the electrodes or any special selection other than that indicated by the part to be covered and the conditions to be fulfilled in the treatment. External electrodes may be covered with any clean conducting material, except sponge, and for low currents felt or absorbing cotton answer well, and the density may be regulated by making the size of the electrode sufficient.

Knowledge of the proper dosage will readily be gained by study and experience, the same way that knowledge of the proper doses of drugs is obtained. The number of milliamperes to be employed will depend upon several factors, such as the size and nature of both the electrodes used, the pathological condition and nature of the tissues treated, the effects desired and duration of treatment. According as these factors vary in relation to each other the proper dose is determined, so that a given number of milliamperes may be in one case a very large dose, in another case a moderate dose and in another case may be so small a dose as to be totally inefficient.

In a general way it may be stated that low currents and large electrodes are employed in ordinary applications where we wish the effects which belong to catalysis. We desire these effects when we seek to improve nutrition, promote circulation, to absorb effusions, to disperse glandular and other enlargements, etc. In these cases the range of milliamperes will vary from 5 to 20, according to the relation of the factors before stated.

In cataphoric medication we must employ sufficient current density to accomplish our results, viz., to convey the medication into the tissues. It is a matter of E. M. F. versus Resistance, rather than one of amperage, but here again, according to the condition of the application, the meter will register from 5 to about 30 milliamperes in different cases.

In negative electrolysis for the dilatation of strictures of the rectum, urethra and uterine canal a strong current would defeat the object of treatment, and only currents which are small in proportion to the size of the active electrode are allowable. The number of milliamperes will in most cases be under 10, and 2 to 5 is often sufficient.

To remove small superficial growths upon the skin or mucous membranes, such as nevi, warts, fibrous and hairy growths, etc., currents are employed which read in small figures, from a few milliamperes down to a fraction of one, but which represent a very considerable

current strength when the active electrode is a fine needle or a slender jeweler's brooch.

It is chiefly in gynecological work that the greatest range of current strength is required, and the application of more than 50 milliamperes is mostly limited to this field and to tumors. With bare metal electrodes both positive and negative poles are caustic above 50 milliamperes, and increasingly so as the amperage is increased. The styptic and astringent effects of the positive pole in its local polar action are obtained from 30 milliamperes or less, while the local polar action of the negative is only liquefying, softening, dissolving and relaxng with 20 ma. or less.

S. H. MONELL, M. D.
44 West 46th st., New York.

Medicine.

IN CHARGE OF
DR. E. W. BING, Chester, Pa.

THE ANTITOXINE TREATMENT OF DIPHTHERIA.

The literature of the antitoxine treatment of diphtheria continues to grow apace, and the rapid extension which its employment finds in all parts of this country, as well as abroad, testify to its therapeutical value. It is to be regretted, therefore, that he introduction of the crude serum has, in the desire to meet the sudden demand created, been so far admitted into general practice.

The constant differences in strength, presence of noxious albuminoidal bodies and other drawbacks, have given rise to complaints of inefficacy, occurrence of secondary effects and sequele, and even deaths; and although these may not destroy confidence in the remedy altogether, the use of such uncertain preparations tends to create confusion, and has already given rise to personal recriminations in the medical papers.

It is hoped that the representative committee selected bythe Clinical Society to investigate these matters will make suggestions confining the preparation of the antitoxine to properly qualified hands. At this juncture it cannot be too emphatically pointed out, once more, that antitoxine and serum are not synonymous terms; but that Dr. Aronson's antitoxine, with which the first results were obtained, and to which the earlier literature entirely refers, consists of the antitoxic principle isolated and separated from inert and noxious albuminoid constituents of the serum. The supply of Dr. Aronson's antitoxine is now restored, and will be continued without interruption, and that it possesses all its old qualities of great concentration and freedom from secondary effects or sequele is evident from the following case published in the British Medical Journal last week:

The patient, aged 26 years, was admitted to the Carlisle Fever Hospital on the second day of illness, with symptoms of diphtheria fully developed. On the next and following mornings 15 minims of Dr. Aronson's antitoxine was injected; it is noteworthy that each injection was followed by an initial fall of temperature, succeeded by a moderate rise toward evening. Already, on the second day of treatment, the patches began to disappear, and the albuminuria that was present prior to the first injection disappeared after the injection, though it recurred for a short time after 10 days.

Another most important point in connection with the preparation is its keeping qualities. Practical trial has shown that Dr. Aronson's antitoxine will keep at least six months without any deterioration, and it is free from the objection urged against the addition of carbolic acid to the injections, as the preservative agent is the harmless Trikresol.—The Therapist.

LEMON JUICE AS A HEMOSTATIC.

Dr. E. T. Burton (Wiener Medizinische Presse, No. 49, 1894) speaks highly of the use of lemon juice as a hemostatic. In a severe case of epistaxis, in a plethoric young man with copious hemorrhage from both nostrils, after injection of a solution of

lemon juice and water (1.4) into the nose with an ordinary glass syringe the hemorrhage ceased. In a case of hematemesis in a woman of 30 years, in whom all the usual remedies had failed the hemorrhage ceased at once after employment of pure lemon juice. It returned, however, the next day, but was rapidly controlled by the use of this simple remedy so that she rapidly convalesced. In a case of intestinal hemorrhage, in typhoid fever, it was also given with equally favorable results, for it ceased as if by magic. The patient died, however, from exhaustion. In the last two cases there was violent vomiting and everything except the lemon juice was ejected.

THE USE OF ALCOHOL IN DIABETES.

Hirschfeld (Berl. klin. Woch., February 4, 1895), discussed the question as to when alcohol in moderate quantity should be allowed, and when altogether prohibited. The author does not agree with the view that alcohol may be an etiological factor in the production of diabetes. In cases of diabetes closely investigated he found that the addition of a small quantity of alcohol (30 to 70 g. per diem) had no ill effect. The quantity of nitrogen in the urine was only temporarily increased. With the use of alcohol more fats could be taken, and hence the increased feeding is made more easy. In two cases with some albuminuria the addition of alcohol led to no increase in the albumen, but in one case the opposite fact was noticed. The sugar was noted at the beginning sometimes to be diminished, at other times to be decreased, but the original level was arrived at later. No change was noted in the acetonuria. In cases where there is already cardiac weakness or vascular disease alcohol should be used cautiously. There is no danger of increasing the polyuria. Alcohol is a food stuff, and yet it may possibly injure the heart, vessels or kidneys. Cases are then given illustrating the different points in treatment. Beer is forbidden, as it contains the most extractive matters, which are chiefly carbohdryates. If a certain amount of these latter are to be allowed they are much better given in bread and vegetables. All sugar containing liquors and sweet wines are, of course, forbidden. Wine, cognac, certain forms of brandy, etc., may be allowed. The author concludes that 30 to 70 g. of alcohol are thoroughly consumed in the body in these cases, that it does not interfere with the secretion of the urine or the absorption of food, and that metabolism is only temporarily increased. The general nutrition, however, is improved. Alcohol has no definite action on the tissue changes peculiar to diabetes. The state of the heart, vessels and kidneys should be borne in mind. The use of alcohol is only necessary in severe cases in order to ward off as much as possible by over-feeding the falling off in strength and the development of tuberculosis.

REMOVAL OF TATOO MARKS.

For obliterating tatoo marks Dr. Variot pours on the marked spot a concentrated solution of tannin, and works it into the skin by series of pricks, just as in tatooing proper. A certain quantity of tannin is thus introduced beneath the skin. He then rubs the part with nitrate of silver, and allows the solution of the salt to remain in situ until the prick marks show out as black points. The caustic is then wiped off, and the result is the formation of a black stain of tannate of silver. Inflammation is set up, and in the course of a fortnight scabs form, on the disappearance of which no trace is left of the original design, the only souvenir being a reddish scar, which in time becomes less visible. Various other plans had been tried without success, scarification, the introduction of opaque powders and caustics into the skin, etc. The tannin, in his operation, acts as a mordant and in no case did he have to deal with troublesome suppuration, although if the area be large it is well to do a piece at a time.—Medical Press and Circular.

Miscellany.

INTERESTING READING.

We present to our readers with this issue two articles of more than ordinary interest to the profession. One is the report of the epidemic of diphtheria in Berks County and the other the article from our Russian contributor on the Germ of Malaria.

These articles show a marked contrast, while they both are of great value. The one exhibits the endless toil of microscopic delving and theoretic deducing, but the other the earnest work of the clinician. Practical value lies in both, which will be of interest to our readers.

BASEDOW'S DISEASE.

Theilhaber has called attention to the frequency of uterine atrophy as a condition, consecutive to Basedow's disease. He had seen three cases. It had been observed, with equal frequency, in mild and severe cases. As the general condition of the patient improves the uterus regains its normal nutrition. The trouble, he believed, was of a vaso-motor origin, not a cause, but a consequence. —Societe Med. Munich, Gaz. Heb., Mar., '95.

TREATMENT OF DISTENTION OF THE FALLOPIAN TUBES WITHOUT LAPAROTOMY AND REMOVAL.

Dr. F. A. Glasgow (Medical Record) brings before the profession a method of curing tubal distension by means of intrauterine treatment, in contradistinction to laparotomy and removal. By this means the uterine ends of the tubes are made more patulous, and a discharge takes place from the tube through the uterus. He calls attention to the fact that the tubes, as far as his observation goes, are always pervious at the outer extremity of the cornu, hence when removing them we must always clamp them before cutting—the obstruction must be within the uterine wall, probably in the endometrium; and also to the fact that gonorrheal inflammation is not an adhesive inflammation, and hence it does not follow that the tubes have a true atresia following this inflammation. His opinion is that the closure is due to a swelling of the endometrium, and hence a closure at the uterine end takes place. When this inflammation and swelling are overcome by pressure and antisepsis, the tubes become patulous again. The intra-abdominal pressure will cause fluid in any pendant portion of the tube to ascend into the uterus. The above procedure can be carried out in three different ways: (1) By gradually packing with gauze without anesthesia; (2) by rapid dilatation of the cervix and packing with gauze after curetting —this is done under anesthesia; (3) his own method of dilating by means of antiseptic or sterilized elm-bark tents. These tents are small strips of elm bark made just long enough to enter the cervix completely and not press on the fundus. They should be kept in an alcoholic solution of bichloride of mercury, 1 to 4000, and have a short string attached, by means of which they may be withdrawn. They are partially broken in a number of places, for the purpose of making them more pliable. They may be dipped into glycerin or water just before introduction. These tents may be used when it would be impossible to pack with gauze. He has treated 20 or more cases during the past year, and does not recall one in which he did not get some discharge from the tent. All of the cases were either cured or very much benefited. —American Lancet.

STERILIZATION OF DOCTORS.

It has been proposed by Gutmann that stations be erected in convenient localities in cities and large towns where physicians may go to be thoroughly disinfected immediately after they have visited a case of infectious diseases, and before paying any further visits. The operation will take about 15 minutes, and then the doctor may go about his business, proud in the consciousness of being clean and no longer a menace to the health of his fellows.—Annals Hygiene.

A LARGE GALL-STONE.

Dr. T. A. McGraw reports in the Medical Age a case of intestinal obstruction which was found on operation to be caused by a gall-stone completely filling the lumen of the intestine, at the junction of the jejunum and ileum. The calculus weighed 250 grains.

Wayside Notes.

By E. B. Sangree, M. D., Philadelphia.

A week or two since this journal reprinted an article on cleansing the nares, which had appeared, I think, in the London Lancet. I agree with the writer that daily cleansing of the nose should be practiced by all. Some say that nature has provided for the proper cleansing of the nose, and that this process should not be interfered with, except in cases of catarrh and the like. By the same token one should maintain that nature has provided for keeping the vagina clean, and that no woman should therefore use a syringe. Yet I fancy few physicians will be found who do not advise their lady patients to use the daily vaginal syringe. In an ideal atmosphere perhaps the nose would not need much cleansing, but until this ideal is attained it certainly does. It is with regard to the method that I radically differ from the English writer.

He advised that the performer should put his entire face in a basin of plain water and then snuff this thoroughly up the nose and blow it out several times; adding that the appearance of the water after this was done would be sufficient proof to anyone of the usefulness and necessity of the procedure. This method is so abdomiable filthy that I am astonished to see it put forward by a physician. Then, too, plain water is irritating to the Schneiderian mucous membrane; it causes pain because the specific gravity is less than that of normal mucous. The proper way to cleanse the nares is to use an atomizer, with a continuous coarse spray, and the water should be rendered alkaline either with one of the alkaline tablets sold everywhere, or with a simple mixture of soda and borax. This addition increases the density of the water and makes it quite unirritating.

I might add that anyone who has used an alkaline spray in this way for sometime will probably afterwards feel it about as necessary and refreshing to wash the inside of the face every day as he formerly did to wash the outside.

If ever allowed to reach the light of day there would be little dull reading in the inside history of those hospitals that have a Lady Board to superintend the nurses and general economy of the institution, whilst the visiting physicans are allowed to prescribe for the patients.

There is still in this city at least one college wth its attached hospital managed on the bipartite plan just referred to, and I am told there are some rencontres within those walls that would be more interesting than a detailed account of the Yalu River engagement or the battle of Ping Yang. In this case the college faculty constitute the visiting staff, and although while surrounded by the college walls they are monarch of all they survey, as soon as the hospital portals are crossed they find themselves barely on sufferance.

As a little example, for instance, of the clashing of authority, I am told that at a clinic the other day the surgeon ordered the nurse who had that matter in charge not to boil the catgut. The head nurse, however, knowing that such a procedure was not strictly aseptic, countermanded this order, and told the nurse to boil the sutures. As the nurse knew that the head nurse received her authority from the Lady Board, and that her own position depended on the dictum of her superior, she naturally obeyed the latter and boiled the catgut. When the surgeon learned what had been done he painted the arena red and blue, to put it figuratively, but—the head nurse still remains.